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(54) Title: METHOD AND PRODUCTS TO FACE FIRES

(57) Abstract

Method for extinguishing fires by applying to the boundaries of the fire an aqueous suspension comprising 1 to 3 % by weight of a polymeric product, which contains up to 400 g of endomolecularly bound water per gram of polymer, and optionally other complementary agents, such as detergents, emulsifiers, adhesion promoters and inorganic compounds (e.g. carbonates, sulfates, silicates, etc.).

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METHOD AND PRODUCTS TO FACE FIRES

The most extended disasters nowadays which destroy Earth's civilisation and terrorises life is that of fires occurring every summer, every year, by which more and more green is destroyed and life is damaged and with those events are vanished fundamental elements of life. The destruction of forests and elements of life with fires results to damaged ecosystems.

Extended fires are also the result of another destructive event, that of abandoning the mountainous areas, the population thus moving for living in plains and in large cities, which is connected with increase in water consumption. These changes of habitat have resulted to abandoning of the vast mountainous areas which largely control the water balance and the biological action on Earth.

There is a need to enter fire facing for survival and to enter fighting the catastrophic fires in which the man is rather weak and in spite of the fact that all available means for quenching water such as aeroplanes, helicopters, ships, tankers are employed. The means in use for fire fighting are water and carbon dioxide applied by all transport means mentioned which are continuously improved but are not that successful to face the increase in fire damages.

In the meantime it has been scientifically proved that adding little water on the fire edges is a successful

fire facing approach. Based on that a new scientific relief has been developed, that could lead successfully facing the Earth's catastrophe.

We have extensively studied the problem of fire facing and have thought and worked to advance products and techniques which lead to successful fire fighting. The original highly profitable approach has derived from our conviction that need and could be discovered solutions with adding to fire edges products can release much water by which the fire ceases at once. And in case these products are organic and could be destroyed by burning their remains could secure effective fire fighting in the area is involved.

We have worked most extensively to fulfil the above and by R & D work we have developed original and most profitable products for that action and we have also advanced proper techniques leading to successful fire facing. The products we have developed are derived from market polymers or from recycled polymers which by processing in different stages become macroplegmatic and of stability to introduce in them polar grouping at high density with which they acquire capacity to absorb water up to 300 times their weight which water is kept endomolecularly and the water is held thus very strongly.

These products, tried in practice, are easily suspended in water in pure form or with selective additives according to needs. The additives which can be added as improvements are : detergents, emulsifiers, adhesives and

materials that do not burn such as carbonates, sulphates, silicates etc. so that the coverage of use can be highly expanded.

The polymeric macroplegmatic products that absorb water up to 300 times endomolecularly, are directed to the fire edges where they are burned releasing much water to fight fires at once. That result has been proved in practice with very successful results in speed of action , in difficult fire control and in wide coverage. Some such results of application are described in the following.

a. Water to face fire contains 2% polymeric material, 1% calcium carbonate pulverised and 0.5% detergent. This was used to face fires developed in wood. A very rapid control of fire was observed and also that fire could not develop for 120 minutes.

b. Water to face fire containing 1% polymeric material 1% pulverised calcium carbonate was used to face fires developed in a forest. The fire was controlled in very short time and the area where water was thrown did not show firing ability.

c. Water contained in emulsion 2% polymeric material, 0.1% detergent and 1% starch to ensure emulsion stability This was used to face fires developed in car tyres. The control of fire was rapid and there was no possibility of a new fire developing in those tyres.

d. After these successful trials was demonstrated fire facing from aeroplane. The water contained 1% polymeric material by weight, and thrown on the fire followed by very impressive result that the fire was controlled

quickly in a wide area and the forest with the solution overthrown did not show efficiency to develop fire.

The originality and the importance of our invention which deals with a problem of survival in our planet is evident. It is showing high potential in dealing with fires. It constitutes a first such possibility to face efficiently the fires in city life out of cities, in forests, in cultivating areas and everywhere.

We know the magnitude of utility of what we are proposing and also the magnitude of our responsibility on that solution. We hope that our lives can change with the possibility developed to face fires and the conception of life and the security to offer is a relief to the overpopulated world.

But the fires have many faces in developing and in destroying and it is necessary that we all collaborate to create a complete solution in the facing of fires so that security can be achieved.

EXAMPLE 1

Polystyrene recycled 100 kg is diluted in 300 litres of 1,2-dichloroethylene solvent and in that solution is added 1 kg of dibenzyl-X-dichloro-dibenzyl chloride as crosslinking agent. The resulting solution is heated to 40° C and then is added 40 ml of concentrated sulfuric acid. After 5 minutes of agitation crosslinking has occurred and when the mixture could not be agitated the

product is taken out, is minced in a machine and then is suspended into 300 litres of solvent. In the suspension resulted at 68° C is added chlorosulfonic acid 2,2 M/M to benzene rings and sulfonation begins. The sulfonation reaction is followed with estimating the hydrogen chloride liberation. Then two layers are gradually formed: that of polymeric insoluble mass and that of solvent and those layers are separated by centrifuging in a decanter The polymeric mass is neutralised with concentrated sodium hydroxide solution and then is directed in sodium chloride 20% solution where most of the water is expelled from the polymeric mass and the remaining water is taken out by taking the mass under electric voltage of 20 V from where the polymeric mass is received practically free of water. The polymeric mass at the end is taken into a reactor where is heated under vacuum to 160° C where the mass becomes soft and homogenic. Finally it is taken into desalinated water and after 6 hr. into it then the polymeric mass had water absorption capacity of 225 (times its weight) and an ion-exchange strength of 4,94.

EXAMPLE 2

Polystyrene 100 kg is dissolved into 300 litres of solvent where acetic acid is added to resist sulfone groups formation in quantity 15% to the solvent volume. It is subjected to sulfonation by adding chlorosulfonic acid 2,2 M/M of benzene rings as a 20% solution in the solvent at 68° C. Two layers are gradually formed. These are separated by decanting and the polymeric product is

further treated like in Example 1. Finally a product of water absorption capacity 350 and ionic exchange strength of 4,96 is obtained.

EXAMPLE 3

A copolymer of acrylonitrile and styrene 40:60 in 10 kg. quantity is diluted into 30 litres of solvent containing 18% acetic acid and in that is added chlorosulfonic acid 2,2 M/M of benzene rings. After the sulfonation treatment a glassy insoluble product separated by decanting is received. It is treated like in example 1 and finally a product with two ionic grouping one acetic and one sulfonic is received. The product finally had a water absorption capacity of 270.

EXAMPLE 4

Fully hydrogenated SBR in quantity of 10 kg is diluted into 30 litres of solvent and cross-linked with the agent dibezyl-X-dimethylobenzyl-chloride using sulfuric acid as catalyst according to the example 1. The thick mass resulting after 20 minutes agitation was minced and subjected into 30 litres of solvent. Then it was sulfonated with oleum (60% SO3) in quantity 3 M/M benzene rings at 10o with cooling. The final product after purification according to the above had a water absorption capacity of 103 and an ion-exchange strength 4,1.

EXAMPLE 5

Preparation of fire facing product formulations

Product A

To be used with water quenching in expanded areas
It is used product of Examples 1 to 4 in pure form and is taken into water for equilibration. Product of the resulted quality is suspended into quenching water in quantity 1-3% and is used to control fires by directing those products into the fire edges.

Product B

Product to be used for personal utilisation to face small fires. It is suggested to use the products in emulsions rather like in the following formulation.

Polymeric product 2-3% Detergent 0.1 %
Starch or petroleum distillates 0.5%
And for better pumping because of higher viscosity are added also inorganic pulverised products such as kalk, sulfates, sand, silicates.

Product C

To face fires developed in organic volatile solvents that burn easily the action should be concentrated and rapid. The polymeric products of 1-4 examples are utilised in

higher concentrations up to 10% if that is possible and are pumped.

Remark. The polymeric products contain much water thus their pumping should not involve high pressure. It is much better to use running water or by applying water pressure or vacuum.

CLAIMS

1. Method of quenching fires with the use of special products, multiprocessed polymers acquiring macroplegmatic structures permitting the introduction of ionic grouping at high density which then absorb high water quantities up to 400 gr. water/gr. of polymer intermolecularly, which products added to fire edges by burning or by decomposing liberate much water with which the fire edges are quenched and the area becomes unburnable.

2. Method according to claim 1 by which the special products which advance complete fire quenching in forests, in cultivated areas, in cities, in industrial units, in transport vehicles when added to the fire edges result to quenching of fires and with the water containing the products is advanced in the area creating fire safe conditions.

3. Method according to the claims 1 & 2 by which the quenching fire products are advanced by all available means and techniques, with aeroplanes, with helicopters, with tankers, which pump water to quench fires where the special products are used in quantities 1-3% by weight.

4. Method according to claims 1 & 3 by which the fire quenching products are burned or decomposed in the fire edges and the excess of them turns the area to fire safe conditions.

5. Method according to claims 1 & 2 by which in the fire quenching products are added and other products facilitating the action such as detergents, emulsifiers, adhesive agents and inorganic materials such as kalk,

sulfates, silicates in pulverised form which do not burn and are mixable and are useful assisting in the fire quenching action.

6. Method of fire quenching according to the claims 1 to 5 by which are used original special fire quenching products which are multiprocessed market polymers or copolymers to acquire ability to absorb water up to 400 gr. of water/gr. of polymer , with the water being kept intermolecularly strongly requiring pressure to take it out, which being introduced on the fire edges advance rapid fire quenching by releasing much water to the fire edges independent to the expansion of fires and to the kind of fires and independent to the substratum, being advanced by all available techniques and means making in the quenching water 1-3% by weight and in solution or suspension may also be added special additives such as detergents, emulsifiers, pulverised inorganic products do not burn which all are applied with the means and the techniques used in fire quenching by aeroplanes, helicopters, tankers, and others and by which the fires are quenched rapidly and profitably.

INTERNATIONAL SEARCH REPORT

Inte tional Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A62D1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A62D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	DE 37 16 304 A (H. VON BLÜCHER ET AL) 24 November 1988 see the whole document ---	1,2,4,5
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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
7 October 1997	17 -10- 1997

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